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NNMC Tissue Bank Completes 25th Year Of Life-Saving

In the past twenty-five years the medical profession has undergone an unprecedented period of advancement. New concepts, technology and techniques have delivered to the world realities which just one quarter-century ago were considered fantasies.

In November, 1949, the National Naval Medical Center officially organized its Tissue Bank, which shortly thereafter became a department of the Medical School. During the past twenty-five years the Tissue Bank has proven to be of considerable value in helping physicians to provide optimal, and at times life-saving, care for their patients.

The Tissue Bank is now a division of the Naval Medical Research Institute and is responsible for the procuring, processing and disbursing of human tissues to military and civilian physicians for use in treating cases where tissue grafting is indicated.

The ideal tissue graft is the fresh autograft, which is a graft taken from one part of the patient's body and transplanted to another part of the same patient. In certain cases, however, an allograft—a graft taken from another individual—has been found to be of considerable benefit, particularly in the lengthy treatment associated with severe burn cases and orthopaedic reconstructive surgery.

The Tissue Bank is the oldest and largest major source of allografts in the United States and most probably the world. It has pioneered the technology of tissue banking and preservation, and has collaborated with over 2000 physicians worldwide, although primary usage is found within the United States.

Initially, the Tissue Bank was only concerned with the procurement and preservation of bone and skin tissues. In the early 1950's, with the use of the lyphilization process, the Tissue Bank began preserving many other tissues.

Lyphilization, more commonly known as freeze-drying, is a process whereby over 95% of the moisture is mechanically removed from the tissue. This freeze-drying technique has since become a standard method in the field of tissue banking, and allows for the storage of tissue samples for years without adverse effect to the future recipient.

Utilizing the lyphilization process, tissues are stored in vacuum-sealed containers at room temperature until needed. The tissue may be re-hydrated for use at any time by the addition of a normal saline solution.

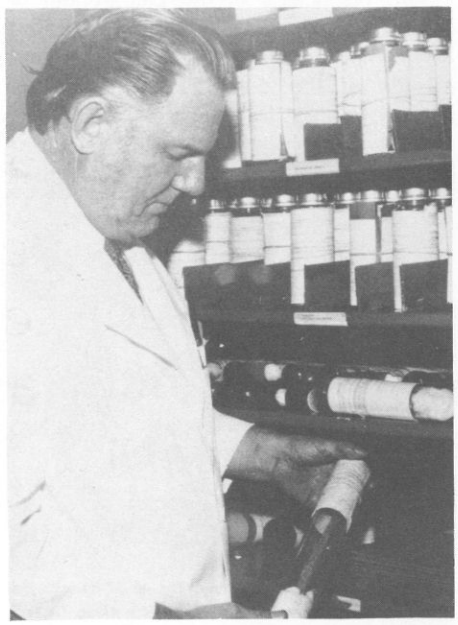
The lyphilization technique kills the cells of the living tissue, but the tissue structure itself remains intact for use as a matrix for surgical reconstruction, as in the case of bone samples, or as a moisture-conserving dressing, as in the case of skin grafts. The Tissue Bank is currently capable of supplying numerous tissues including bone, skin, fascia, dura, tendon, nerve, and various cardio-vascular tissues.

The tissue preserved by the Tissue Bank is procured by sterile technique and is performed in the asceptic operating room suite located in the Tissue Bank. The criteria for selecting donors are quite rigid. Because the tissues provided by the Tissue Bank are used as surgical grafts, the samples must be free of all known diseases including cancer and infection. Statistically, the largest percentage of acceptable donors are those who expire of heart attacks, strokes or automobile accidents.

The sterile tissue collection must be performed within twenty-four hours after death, except for corneas which must be removed within six hours to be suitable for transplantation. Prior permission to perform the post-mortem excision may be given by the donor or given by the next of kin following death.

A pathologist's report is further evaluated to ensure that the donor was free of all diseases which might endanger the health of a future recipient. The personnel of the Tissue Bank perform an average of three post-mortems each month and have performed over 1400 such procedures since 1949.

From the outset, the Tissue Bank has kept a registry of all tissue grafts it has prepared. When tissue samples are released, the collaborating physician agrees to provide the Tissue Bank with follow-up data on the success or failure of treatment. Currently the Tissue Bank has received data on over 8500 cases, including x-rays, operative reports and pathology slides. This data is evaluated for the benefit of future graft recipients.



Tissue Bank staff member Vernon Gambil inspects bone sample stored in vacuum-sealed container.

In collaboration with other NMRI divisions, the Tissue Bank is also investigating the graft-versus-host phenomenon, in an attempt to minimize the rejection of allografts by tissue recipients. Furthermore, Tissue Bank personnel have been compiling data on tissue typing, which will hopefully provide a standardized means of categorizing tissue samples which will be compatible with those of a future recipient.

The 40 technicians of the Tissue Bank, located in several hospitals and the procurement station in San Diego, have all completed a 9-month training regimen which included courses in cell and tissue preservation, anatomy and physiology, hemodialysis, chemistry, bacteriology and immunology. All the Tissue Bank technicians are fully qualified to perform the procurement surgery.

With the mounting evidence of success in the clinical and surgical usage of preserved tissue, tissue banking is fast becoming a standard in the medical profession. Thus, personnel of the Tissue Bank may confidently look forward to at least another quarter-century of service in the vanguard of medical technology.